

ENDAT-5301

Embedded Industry Board

User's Manual

Rev. 1x

(For PCB 1x)

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Installation Notice

The manufacturer recommends using a grounded plug to ensure proper motherboard operation. Care should be used in proper conjunction with a grounded power receptacle to avoid possible electrical shock. All integrated circuits on this motherboard are sensitive to static electricity. To avoid damaging components from electrostatic discharge, please do not remove the board from the anti-static packing before discharging any static electricity to your body, by wearing a wrist-grounding strap. The manufacturer is not responsible for any damage to the motherboard due to improper operation.

Specification:

| MODEL | | ENDAT-5301 |
|--------------------------|----------------|---|
| CPU | | Pentium 90-550MHz, INTEL MMX, AMD K5/K6/K6-2/K6-3, IDT C6, Rise MP6, IBM Cyrix 6x86 CPUs |
| System Chipset | | VIA Chipset |
| VGA Chipset | | Built-in, With Share Memory Architecture (SMA) |
| LCD Feature (Optional) | | Optional Support TFT/ DSTN LCD |
| LAN Chipset | | Realtek 8139A/B 10/100 BaseT(Boot ROM Optional) |
| Audio Feature (Optional) | | Via AV Card kit |
| FLASH Disk | | Socket for DiskOnChip2000 |
| System Memory | | Up to 256MB(PC66/PC100) |
| IDE Interface | | PCI IDE Support Ultra DMA33/66 |
| Multi I/O | | Supports 4 Serials and 1 Parallel Ports COM1, 3, 4 with +5V/+12V Power Supports RS422/485 for COM2 (Optional) |
| External Cache | | 512KB Burst Cache |
| WatchDogTimer (Optional) | | Yes |
| IrDA / USB Port | | Yes(Pin Header) |
| Expansion Slot | | One PCI Slot / PC-104 Connector Optional |
| AD Selector | PCI 1 PCI 2 | AD24 LAN (INT.A,B,C,D) AD23 FREE (INT.B,C,D,A) as expansion slot. |
| Keyboard / Mouse Jack | | Pin Header Type |
| Pin Header for | | Keyboard / Mouse / VGA / Multi I/O ports |
| Power Connector | | PS/2; ATX Type Optional |
| Form Factor / Size | | SBC Form Factor; 203 x 146mm |

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ENDAT-5301

Chapter 1. Introduction

The ENDAT-5301 Embedded Industrial Board uses VIA chipsets built-in VGA onboard supports TFT/DSTN Flat Panel, Audio and Watch Dog Timer, built-in Realtek 8139xx LAN chipset with RJ45 Jack for 10BaseT/100BaseT. Our board offers the highest performance PC specifications in the industry. The ENDAT-5301 runs with the Intel Pentium P54C/P55C, AMD K5/K6, K6-2/K6-3, IDT C6, Rise MP6 or IBM/Cyrix 6x86 CPU upto 550MHz.

The motherboard is fully compatible with industry standards, adding many technical enhancements and is fully compatible with thousands of software applications developed for IBM PC/AT compatible computers. The control logic provides high-speed performance for the most advanced multi-user, multitasking applications available today. “Tomorrow’s PC technology is here today”.

1-1. Features

Basic Feature:

- Supports all Socket-7 / Supper-7 Processors Including 64-bit Intel Pentium™, Pentium™ MMX, AMD K6™, K6-2, -3™, IDT C6, Rise MP6 and IBM/Cyrix 6x86 CPUs Clock base on 60MHz ~ 100MHz “Front Side Bus”(FSB), supports 90MHz – 550MHz
- PC-98/99 Compatible using VIA VT82C686A super south bridge chip.
- Pipelined burst synchronous SRAM cache support, maximum 512KB cache.
- Supports 64-bit DRAM interface synchronous with host CPU (66/100MHz) or internal Memory Clock (100MHz).
- Supports up to 256MB memory with one DIMM socket (PC-100/66 DIMM)
- Independent clock stop controls for CPU /SDRAM, Internal AGP and PCI bus.
- Built-in PCI BUS master IDE controller onboard supports one PCI bus slot and floppy drive controller.
- PCI-2.2 compliant, 32 bit 3.3V PCI interface with 5V tolerant inputs.

- Onboard reserved 32 Pins socket supports M-System Disk-On-Chip product
- Onboard LAN Adapter supports 10/100BaseT, (On board) BOOT ROM optional
- Supports 4 COM ports, STD. RI (RS-232), COM1, 3, 4 with +12V/+5V DC Power selectable and one SPP/EPP/ECP Parallel port.
- Supports Ultra DMA33/66 EIDE
- Supports for 4 high-speed UARTS (W/16550 FIFO) and multi-mode
- Parallel port with standard, enhanced (EPP) and high-speed (ECP) mode
- Onboard built-in USB functions
- Onboard built-in 2x AGP VGA BUS adapter, AGP v2.0 compliant for 1x and 2x transfer modes
- Expansion slot for one PCI slot and one PC-104 connector ISA BUS signals
- AWARD BIOS FLASH ROM
- IR function can be Enabled/Disabled by BIOS
- Onboard LAN adapter can be Enabled/Disabled by jumper.

Optional Features

- Supports RS232/RS422/RS485 interface via COM2
- Supports LCD feature with TFT/DSTN Panel (Panel Link interface)
- Supports Audio function with AV Card Kit
- Optional LVDS Transmitter / Receiver board with cable.

1-2. Unpacking

The motherboard comes securely packaged in a sturdy cardboard shipping carton. In addition to the User's Manual, the motherboard package includes the following items:

- ENDAT-5301 Embedded Industry Board
- HDC/FDC Cables
- VGA Cable
- PS/2 Mouse/Keyboard Cable
- Audio Kit (Optional)
- LVDS kit for LCD features.
- Serial port kit for 4 ports
- All drivers can support for Windows 3.1/95/98/98se/me/2000/NT3.x/4.x Novell Netware and BIOS update utility, all drivers are already built in our CD-ROM or you can check our web-site to update the latest version of drivers.
- VGA / Audio utilities and software drivers
- Driver utilities for LAN adapter

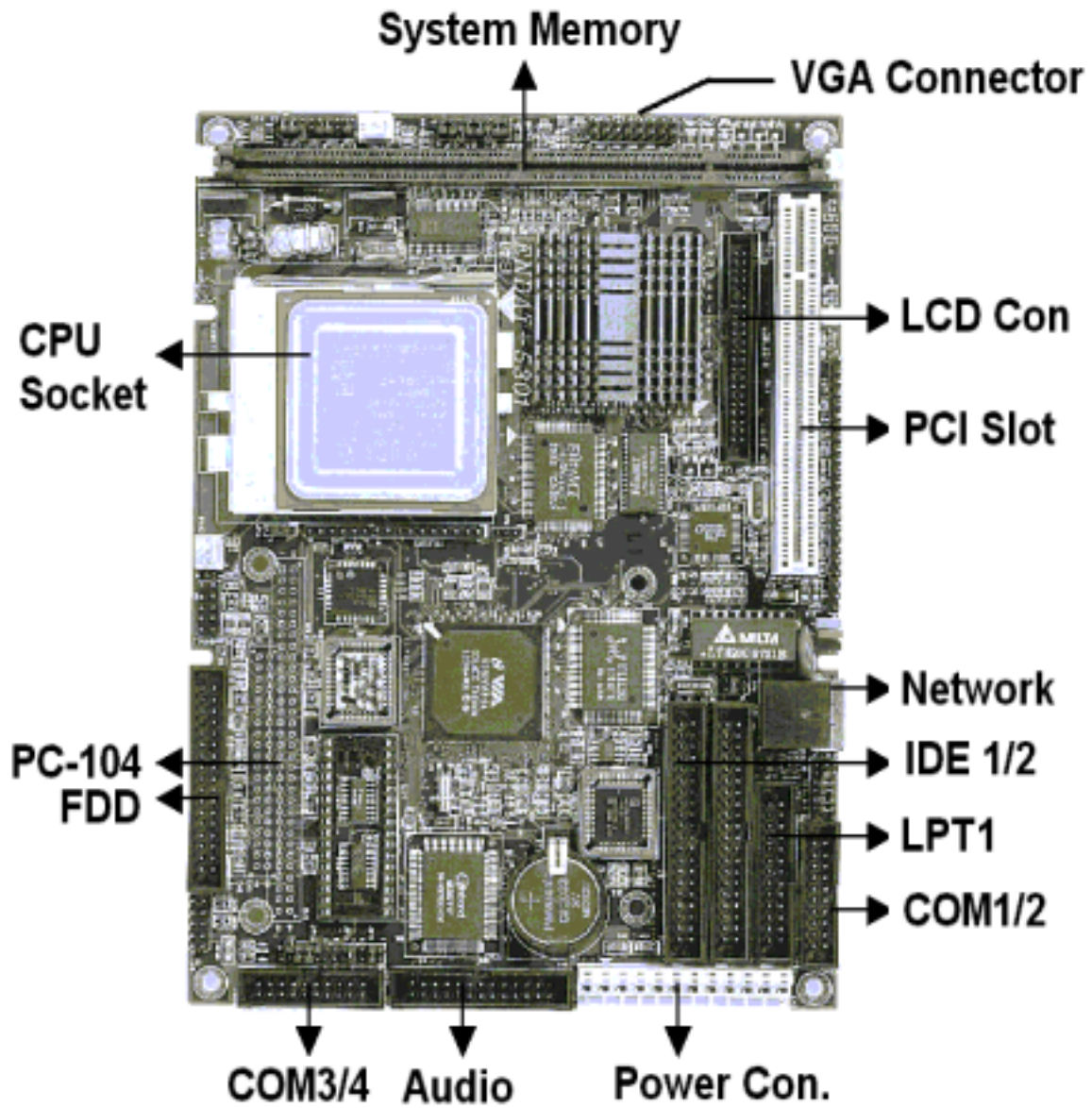
If any of these items are missing or damage, please contact the dealer from whom you purchased the motherboard. Save the shipping materials and carton in the event that you want to ship or store the board in the future.

Note: Leave the motherboard in its original package until you are ready to install it!

1-3. Electrostatic Discharge Precautions

Make sure you properly ground yourself before handling the motherboard, or other system components. Electrostatic discharge can easily damage the components. Note: You must take special precaution when handling the motherboard in dry or air-conditioned environments.

1-4. Embedded Industry Board Layout



Chapter 2. Setting up the Motherboard

This chapter describes how to set up the motherboard and get read for operation.

- Installing the CPU upgrade
- Installing DIMM memory. Make sure the correct CPU operating voltage, jumper settings and frequency.
- Double-check the insertion and orientation of the CPU before applying power. Improper installation will result in permanent damage to the CPU.

2-1. Jumpers and Connectors (ENDAT-5301)

Jumpers/Connectors Overview:

| Function | Jumpers/Connectors |
|--------------------------------------|-------------------------------|
| CPU: CPU Clock Frequency | S1 (Pin 1,2,3,4,5,6,7,8) |
| CPU Vcore Voltage | S2 (Pin 1,2,3,4,5,6,7,8,9,10) |
| CPU Ratio | S2 (Pin 11,12,13,14,15,16) |
| Connector for Cooling Fan | FAN1, FAN2 |
| Power Supply: Type (ATX or PS/2) | CN1, CN2 |
| Power Good | JP15 |
| Audio /TV-Out Output Port Connector | CN3 |
| TTL Output Pin Header (For COM2) | TTLOUT1 |
| LAN Adapter Disable/Enable | JP6 |
| COM3 Port | COM3 |
| COM4 Port | COM4 |
| COM Ports Power Selector (COM1, 3,4) | JP3, JP9, JP8 |
| RS232/RS422/RS485 Selector (COM2) | JP4, JP5, JP2, JP1 |
| DiskOnChip Memory Address | JP10 |
| LCD Connector | LCD_CON1 |
| Clear CMOS | JP7 |

| Function | Jumpers/Connectors |
|---|----------------------------------|
| PS/2 Mouse/KB Pin Header | CN7 |
| IR | IR1 |
| USB Header | CN8 |
| PC-104 Connector | CN4, CN5 |
| FDD Connector | CN6 |
| IDE 1 | J2 |
| IDE 2 | J3 |
| Header for Case Panel | J1 |
| IDE 1 LED | J1 Pin 1, Pin 2 |
| IDE 2 LED | J1 Pin 3, Pin 4 |
| External Speaker | J1 Pin 5, Pin 8 |
| Buzzer On/Off | J1 Pin 6, Pin 7 |
| Hardware Reset Switch | J1 Pin 9, Pin 10 |
| Key Lock Switch | J1 Pin 11, Pin 12 |
| Power LED | J1 Pin 13, Pin 14 |
| ATX Power Supply On/Off Switch | J1 Pin 15, Pin 16 |
| Turbo LED for Case (for case only, no function) | J1 Pin 17, Pin 18 |
| ATX or PS/2 Power Selector | J1 Pin 19, Pin 20, Pin 21 |
| Ring-Detected | J1 Pin 22, Pin 23 |

Note: The cooling fan and heat sink are required for Pentium processors. Please pay close attention to the direction of the CPU and cooling fan when install. Position the cooling ventilator directly facing the regulator heat sink, which is located beside the CPU socket. This will reduce the overheating of the regulator and increase the reliability of the system.

S1: CPU Clock Selector

| 1-2 | 3-4 | 5-6 | 7-8 | CPUCLK | PCICLK |
|------------|------------|------------|------------|---------------|---------------|
| OPEN | OPEN | OPEN | OPEN | 60MHz | 30MHz |
| OPEN | OPEN | OPEN | SHORT | 75MHz | 37.5MHz |
| SHORT | OPEN | SHORT | OPEN | 83.3MHz | 27.76MHz |
| SHORT | SHORT | OPEN | OPEN | 90MHz | 30.00MHz |
| OPEN | SHORT | SHORT | OPEN | 95.25MHz | 31.75MHz |
| OPEN | OPEN | SHORT | OPEN | 97MHz | 26.67MHz |
| SHORT | SHORT | SHORT | OPEN | 100MHz | 33.33MHz |
| SHORT | SHORT | OPEN | SHORT | 105MHz | 35.00MHz |
| OPEN | OPEN | SHORT | SHORT | 110MHz | 36.67MHz |
| SHORT | OPEN | SHORT | SHORT | 115MHz | 38.33MHz |
| OPEN | SHORT | SHORT | SHORT | 120MHz | 40.00MHz |
| SHORT | SHORT | SHORT | SHORT | 124MHz | 41.33MHz |

S2: CPU Vcore voltage selector

| S2 1-2 | S2 3-4 | S2 5-6 | S2 7-8 | S2 9-10 | Vcore |
|--------|--------|--------|--------|---------|-------|
| SHORT | SHORT | SHORT | SHORT | OPEN | 3.5V |
| OPEN | SHORT | SHORT | SHORT | OPEN | 3.4V |
| SHORT | OPEN | SHORT | SHORT | OPEN | 3.3V |
| OPEN | OPEN | SHORT | SHORT | OPEN | 3.2V |
| SHORT | SHORT | OPEN | SHORT | OPEN | 3.1V |
| OPEN | SHORT | OPEN | SHORT | OPEN | 3.0V |
| SHORT | OPEN | OPEN | SHORT | OPEN | 2.9V |
| OPEN | OPEN | OPEN | SHORT | OPEN | 2.8V |
| SHORT | SHORT | SHORT | OPEN | OPEN | 2.7V |
| OPEN | SHORT | SHORT | OPEN | OPEN | 2.6V |
| SHORT | OPEN | SHORT | OPEN | OPEN | 2.5V |
| OPEN | OPEN | SHORT | OPEN | OPEN | 2.4V |
| SHORT | SHORT | OPEN | OPEN | OPEN | 2.3V |
| OPEN | SHORT | OPEN | OPEN | OPEN | 2.2V |
| SHORT | OPEN | OPEN | OPEN | OPEN | 2.1V |
| OPEN | SHORT | SHORT | SHORT | SHORT | 2.0V |
| OPEN | SHORT | SHORT | SHORT | SHORT | 1.95V |
| OPEN | OPEN | SHORT | SHORT | SHORT | 1.9V |
| SHORT | SHORT | OPEN | SHORT | SHORT | 1.85V |
| OPEN | SHORT | OPEN | SHORT | SHORT | 1.8V |

☞ Note : S2 (1-2, 3-4, 5-6, 7-8, 9-10)

CPU Vcore must be correctly set before system Power-on.

S2: (11-12,13-14,15-16) : CPU Ratio setting

| S2 11-12 | S2 13-14 | S2 15-16 | CPU Ratio |
|----------|----------|----------|-----------|
| SHORT | SHORT | OPEN | 2.5x |
| OPEN | SHORT | OPEN | 3.0x |
| SHORT | OPEN | OPEN | 2.0x/6.0x |
| OPEN | OPEN | OPEN | 1.5x/3.5x |
| SHORT | SHORT | SHORT | 4.5x |
| OPEN | SHORT | SHORT | 5.0x |

| | | | |
|-------|------|-------|------|
| SHORT | OPEN | SHORT | 4.0x |
| OPEN | OPEN | SHORT | 5.5x |

JP6: On-board LAN Disable/Enable

| | |
|-----------|----------------------|
| Pin 1-2 * | Enable On-Board LAN |
| Pin 2-3 | Disable On-Board LAN |

JP7: CMOS Data Clear:

| | |
|-----------|-----------------|
| Pin 1-2 * | Normal |
| Pin 2-3 | Clear CMOS Data |

JP10: DiskOnChip Memory Address Selector

| JP10 | | Memory Address |
|------|------|------------------------|
| 1-2 | 7-8 | 0C800H-0C9FFH |
| 1-2 | 9-10 | 0CC00H-0CDDFFH |
| 3-4 | 7-8 | 0DCCCH-0D1FFH |
| 3-4 | 9-10 | 0D400H-0D5FFH |
| 5-6 | 7-8 | 0D800H-0D9FFH(Default) |

JP3 (COM1) / JP9 (COM4) / JP8 (COM3) Voltage Selector:

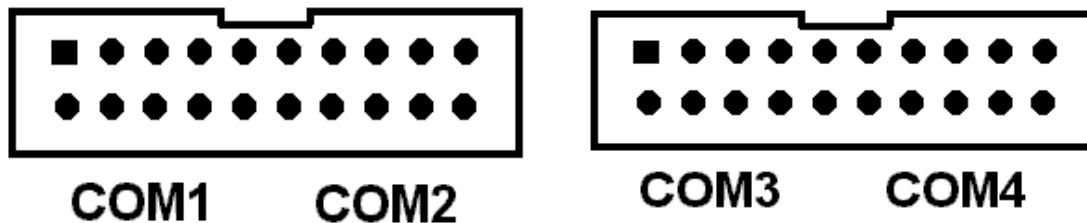
| Pin No. | JP3(COM1) | JP9(COM4) | JP8(COM3) |
|---------|------------|------------|-------------|
| 1-2 | +5V | +12V | +12V |
| *3-4 | STD RS-232 | STD RS-232 | STD..RS-232 |
| 5-6 | +12V | +5V | +5V |

JP4, JP5, JP2, JP1: RS232 / 422 / 485 Selector for COM2

| TYPE | JP4 | JP5 | JP2 | JP1 |
|----------|-----|-------|----------------------|----------|
| RS-232 * | 1-2 | Open | 1-2, 4-5, 7-8, 10-11 | Open |
| RS-422 | 3-4 | Close | 2-3, 5-6, 8-9, 11-12 | 1-3, 2-4 |

| | | | | |
|--------|-----|-------|----------------------|----------|
| RS-485 | 5-6 | Close | 2-3, 5-6, 8-9, 11-12 | 3-5, 4-6 |
|--------|-----|-------|----------------------|----------|

Make sure the port mode is set up correctly before installing any peripherals.



Special combination of COM1+COM2 / COM3+COM4

JP15 : On-board Power Good Selector

| | |
|-----------|---------------------------|
| Pin 1-2 * | Using External Power Good |
| Pin 2-3 | Using On Board Power Good |

FAN1, FAN2: CPU / 2nd Cooling Fan Connector

| Pin No. | Function |
|---------|-------------|
| Pin 1 | Sensor Pin. |
| Pin 2 | +12V |
| Pin 3 | GND |

J1's Pin15-16; 19-20-21: For ATX Power Supply

| | |
|-----------------|-----------------------------|
| Close Pin 19-20 | Using PS/2 AT Power Supply |
| Close Pin 20-21 | Using ATX Power Supply |
| Pin 15; Pin 16 | On/Off Switch for ATX Power |

CN3: Audio Output Port connector via AV Card Kit (Optional)

The AV Card Kit Adapter supports Speaker-Out, MIC-In, Line-In, TV-OUT, S-Video and Game Port. Please close pin13-14 to disable onboard Audio features if the AV Card Kit is not inserted onto the CN3 connector.

J1: Case Panel connection

| Pin No. | Description |
|---------|-------------|
|---------|-------------|

| | | | |
|------------|--|---------------------|-----------|
| 1, 2 | IDE 1 LED | Pin 1 = - | Pin 2 = + |
| 3, 4 | IDE 2 LED | Pin 3 = - | Pin 4 = + |
| 5, 8 | External Speaker | | |
| 6, 7 | Onboard Buzzer | | |
| 9, 10 | Reset Switch | | |
| 11, 12 | Key Lock Switch | | |
| 13,14 | Power LED Indicator | | |
| 15, 16 | Power On/Off Switch (for ATX Power only) | | |
| 17, 18 | Turbo LED(for case only, no function) | | |
| 19, 20, 21 | 19-20 for AT Power | 20-21 for ATX Power | |
| 22, 23 | Modem Ring Detected / Wake on LAN | | |

LCD_CON1 (Only for Support LCD Version)

| Pin No. | Description | Pin No. | Description |
|---------|----------------|---------|----------------|
| 1 | VBL | 2 | VBL |
| 3 | GND | 4 | GND |
| 5 | VDDLCD (+3.3V) | 6 | VDDLCD (+3.3V) |
| 7 | ENPVEE | 8 | GND |
| 9 | FPD23 | 10 | FPD22 |
| 11 | FPD17 | 12 | FPD16 |
| 13 | FPD11 | 14 | FPD10 |
| 15 | FPD9 | 16 | FPD8 |
| 17 | FPD21 | 18 | FPD20 |
| 19 | FPD15 | 20 | FPD14 |
| 21 | FDP7 | 22 | FPD6 |
| 23 | FPD5 | 24 | FPD4 |
| 25 | FPD19 | 26 | FPD 18 |
| 27 | FPD13 | 28 | FPD12 |
| 29 | FPD3 | 30 | FPD2 |
| 31 | FPD1 | 32 | FPD0 |
| 33 | GND | 34 | GND |
| 35 | SHFCLK | 36 | FLM |
| 37 | M_DE | 38 | LP |
| 39 | GND | 40 | VCCUPBKL |
| 41 | VCCUPBKL | 42 | Key |
| 43 | Vcc (+5V) | 44 | Vcc (+5V) |

Please make sure the Pin 1 location is set up correctly before inserting the LCD

connector.

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18Bit TFT / 16Bit DSTN LCD Panel Mapping

| 18Bit TFT | 16Bit DSTN | 18Bit / 18+18 TFT | Pin No. |
|-----------|------------|-------------------|---------|
| NC | N.C. | FPD23 | 9 |
| NC | N.C | FPD22 | 10 |
| NC | N.C | FPD21 | 17 |
| NC | N.C. | FPD20 | 18 |
| NC | N.C | FPD19 | 25 |
| NC | N.C | FPD18 | 26 |
| B0 | N.C | FPD17 | 11 |
| B1 | N.C | FPD16 | 12 |
| G0 | UD7 | FPD15 | 19 |
| G1 | UD6 | FPD14 | 20 |
| R0 | UD5 | FPD13 | 27 |
| R1 | UD4 | FPD12 | 28 |
| B2 | UD3 | FPD11 | 13 |
| B3 | UD2 | FPD10 | 14 |
| B4 | UD1 | FPD9 | 15 |
| B5 | UD0 | FPD8 | 16 |
| G2 | LD7 | FPD7 | 21 |
| G3 | LD6 | FPD6 | 22 |
| G4 | LD5 | FPD5 | 23 |
| G5 | LD4 | FPD4 | 24 |
| R2 | LD3 | FPD3 | 29 |
| R3 | LD2 | FPD2 | 30 |
| R4 | LD1 | FPD1 | 31 |
| R5 | LD0 | FPD0 | 32 |

2-3. Installing Memory

The motherboard offers two 168pin DIMM sockets, which support up to 512MB of memory. The DIMM memory can be 66MHz or 100MHz (PC-100).

2-4. Shared VGA Memory

The ENDAT-5301 has built-in 2x AGP VGA controller with share memory architecture (SMA), and is using either **AGP mode with 4MB/8MB** or **PCI mode with 2MB** of system memory (customize setting only). The amount of video memory on your motherboard determines the number of colors and the video graphic resolution.

2-5. Installing Riser Card

Installing Riser Card (Max. 1 PCI Slot on Riser Card)

| PCI Slot | INT | ADSEL |
|----------|------------|--------------------|
| PCI 1 | A, B, C, D | AD24 (Onboard LAN) |
| PCI 2 | B, C, D, A | AD23 |

The ENDAT-5301 Embedded Industry Board supports one PCI Slot and PC-104.

2-6. Assigning IRQs for Expansion Cards

Some expansion cards require an IRQ to operate. Generally, each IRQ must be exclusively assigned to one use. In a standard design, there are 16 IRQ available with 11 of them already in used by other part of the system.

Both PC-104 (ISA) and PCI expansion cards may need to use IRQ. Cards installed in the PC-104 (ISA) expansion slot have the first priority to use the available system IRQ. Any remaining IRQ then may be auto assigned to PCI Bus by system. You can use Microsoft's Diagnostic (MSD.EXE) utility included in the Windows directory to see their map. Make sure that there are no two devices using the same IRQ in the system. Otherwise this will cause the system to hang up or give unexpected results. To simplify the process, this motherboard complies with the Plug and Play (PnP) specifications, which was developed to allow automatic system configuration. Whenever a PnP-compliant card is added to the system, PnP cards and IRQs are automatically assigned if available. If the system has both Legacy and PnP ISA cards installed. IRQs are assigned to PnP cards from those not used by Legacy cards. The PCI and PnP configuration of the BIOS setup utility can be used to indicate which IRQs have being used by Legacy cards. For older Legacy cards that do not work with the BIOS, you can contact your vendor for an ISA configuration utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by Legacy and PnP ISA cards. In the PCI Bus design, the BIOS is automatically assigned an IRQ to a PCI slot that has a card in it which requires an IRQ. To install a PCI card, you need to set the correct "ADSEL" and "INT" (interrupt) assignment. Please refer to "Chapter 2-5" Installing a Riser Card for detail assignments.

| IRQ | Status | Assignment |
|------------|---------------|---------------------|
| 0 | Used | Timer |
| 1 | Used | Keyboard |
| 2 | Used | Second 8259 |
| 3 | Used | COM2 |
| 4 | Used | COM1 |
| 5 | Used | COM3 / SoundBlaster |
| 6 | Used | Floppy Disk |

| IRQ | Status | Assignment |
|------------|---------------|--------------------------------|
| 7 | Used | LPT1 |
| 8 | Used | RTC |
| 9 | Used | Redirected IRQ2 / SoundBlaster |
| 10 | Used | COM4 (Optional) |
| 11 | Used | LAN Adapter (on board) |
| 12 | Used | PS/2 Mouse |
| 13 | Used | Coprocessor |
| 14 | Used | Hard Disk (IDE 1) |
| 15 | Used | Reserved (IDE 2) |

2-7. Assigning DMA Channels for ISA Cards

Since ISA cards, both Legacy and PnP may also need to use a DMA (direct memory access) channel, DMA assignments for this motherboard are handled the same way as the IRQ assignment process described above. You can select a DMA channel in the PCI and PnP configuration section of the BIOS setup utility. In the BIOS setup, you should choose "Yes" for those IRQ's and DMA's you wish to reserve for Legacy cards.

Chapter 3. AWARD BIOS SETUP

Use the CMOS setup program to modify the system parameters to reflect the environment installed in your system and to customize the system as desired. Press the key to enter into the CMOS setup program when you turn on the power. Settings can be accessed via arrow keys. Press <Enter> to choose an option to configure the system properly.

In the main menu, press F10 or “SAVE & EXIT SETUP” to save your changes and reboot the system. Choose “EXIT WITHOUT SAVING” to ignore the changes and exit the setup procedure. Pressing <ESC> at anywhere during the setup will return to the main menu.

“THE BIOS FEATURE SETUP”, “CHIPSET FEATURE SETUP” and “PCI CONFIGURATION SETUP” requires board knowledge on PC/AT system architecture and VIA MVP3 chipset specification. They intend to be used by well-trained technicians and experienced users. Incorrect setup could cause system malfunctions.

3-1. Quick Setup

In most cases, you can quickly configure the system by using the following procedure. The manufacturer highly recommends that you use “Quick Setup” for setting CMOS to avoid any unpredictable results.

1. Choose “STANDARD CMOS SETUP” from the main menu, to configure the date and time, hard disk type, floppy disk drive type etc.
2. Choose “LOAD SETUP DEFAULTS” from the menu for loading the defaults. The default setting of the “BIOS Feature Setup” and “Chipset Feature Setup”, which is set by the manufacturer, is the most stable normal configuration.
3. Press F10 or “SAVE & EXIT SETUP” to save the changes and reboot the system.

3-2. Description of the BIOS Setup Option

Please make clear the means of those option parameters. Improper settings will cause the system to hang up or perform poorly. Most items are clearly understood from the prompt screen. The manufacturer highly recommends that “Default” settings have been used to avoid any unpredictable results.

3-3. BIOS Feature Setup

ROM PCI/ISA BIOS (2A5LHU4A)

BIOS FEATURES SETUP

AWARD SOFTWARE, INC

| | | | |
|----------------------------|------------|----------------------|------------|
| Virus Warning | : Disabled | Video BIOS Shadow | : Enabled |
| CPU Internal Cache | : Enabled | C8000-CBFFF Shadow | : Disabled |
| External Cache | : Enabled | CC000-CFFFF Shadow | : Disabled |
| Quick Power On Self Test | : Enabled | D0000-D3FFF Shadow | : Disabled |
| Boot Sequence | : A,C,SCSI | D4000-D7FFF Shadow | : Disabled |
| Swap Floppy Drive | : Disabled | D8000-DBFFF Shadow | : Disabled |
| Boot Up Floppy Seek | : Disabled | DC000-DFFFF Shadow | : Disabled |
| Boot Up NumLock Status | : On | Cyrix 6x86/MII CPUID | : Enabled |
| Gate A20 Option | : Normal | | |
| Memory Parity/ECC Check | : Disabled | | |
| Typematic Rate Setting | : Disabled | | |
| Typematic Rate (Chars/Sec) | : 6 | | |
| Typematic Delay (Msec) | : 250 | | |
| Security Option | : Setup | | |
| PCI/VGA Palette Snoop | : Disabled | | |
| OS Select For DRAM > 64MB | : Non-OS2 | | |

3-4. Details of the Chipset Feature Setup

ROM PCI/ISA BIOS (2A5LHU4A)
CHIPSET FEATURE SETUP
AWARD SOFTWARE, INC

| | |
|------------------------|----------------|
| Bank 0/1 DRAM Timing | : SDRAM 8/10ns |
| Bank 2/3 DRAM Timing | : SDRAM 8/10ns |
| SDRAM Cycle Length | : 2 |
| DRAM Read Pipeline | : Enabled |
| Sustained 3T Write | : Enabled |
| Cache R/CPU W Pipeline | : Enabled |
| Cache Timing | : Fast |
| Video BIOS Cacheable | : Enabled |
| System BIOS Cacheable | : Enabled |
| Memory Hole | : Disabled |
| Init Display First | : AGP |
| Frame Buffer Size | : 8M |
| AGP Aperture Size | : 128M |
| OnChip USB | : Disabled |
| OnChip Sound | : Enabled |

Bank 0/1, 2/3 DRAM Timing

This field is set by the system board manufacturer, which is base on whether the board has paged DRAMs or SDRAMs.

SDRAM Cycle Length

This item sets the CAS latency timing.

DRAM Read Pipeline

You may select Enabled for this field when PDSRAMs are installed. Pipelining improves system performance.

Cache R/CPU W Pipeline

This item allows you to enable or disable the cache timing.

Video BIOS Cacheable

When enabled, the Video BIOS cache will cause access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled.

System BIOS Cacheable

Enabling this selection allows access to the system BIOS ROM addressed F0000H-FFFFFH to be cached, provided the cache controller is enabled.

Memory Hole At 15Mb Addr.

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

Init Display First

Setting the initiate display type with "PCI" or "AGP" mode

Frame Buffer Size

Allocate the share memory size from system memory for Video

AGP Aperture Size

Selecting the size of Accelerated Graphics Port (AGP) aperture. The Aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.apgforum.org for AGP information.

OnChip USB

Select "Enabled" if your system contains a Universal Serial Bus (USB) controller and you have a USB peripheral. The "Assign IRQ for USB" has to be set to Enabled on "PnP/PCI Configuration" (when the USB is used.)

On Chip Sound

Setting the On Chip sound feature to disabled or enabled

3-5. Details of Power Management Setup

ROM PCI/ISA BIOS (2A5LHU4A)
 POWER MANAGEMENT SETUP
 AWARD SOFTWARE, INC

| | | | |
|--------------------|--------------------|---------------|-------------|
| ACPI Function | : Disabled | Primary INTR | : ON |
| Power Management | : User Define | IRQ3 (COM2) | : Primary |
| PM Control by APM | : Yes | IRQ4 (COM1) | : Primary |
| Video Off Method | : V/H Sync + Blank | IRQ5 (LPT 2) | : Primary |
| Video off After | : Suspend | IRQ6 (FDD) | : Primary |
| MODEM Use IRQ | : 3 | IRQ7 (LPT 1) | : Primary |
| Doze Mode | : Disable | IRQ8 (Alarm) | : Disabled |
| Suspend Mode | : Disable | IRQ9 (Rsv) | : Secondary |
| HDD Power Down | : Disable | IRQ10 (Rsv) | : Secondary |
| Soft-Off by PWRBTN | : Instant-Off | IRQ11 (Rsv) | : Secondary |
| ** PM Events ** | | IRQ12 (PS/2) | : Primary |
| VGA | : OFF | IRQ13 (CoPro) | : Primary |
| LPT & COM | : LPT/COM | IRQ14 (HDD) | : Primary |
| HDD & FDD | : ON | IRQ15 (Rsv) | : Disabled |
| PCI Master | : OFF | | |

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Doze Mode
2. Suspend Mode
3. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings:

| | |
|-------------------|---|
| Disable (Default) | No Power Management. Disables all four modes |
| Min. Power Saving | Minimum power management. Doze Mode = 1 hr., Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD power down = 15 min. |

| | |
|-------------------|--|
| Max. Power Saving | Maximum power management – Only Available for SL CPU's. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., And HDD power down = 1 min. |
| User Defined | Allows setting each mode individually. When enabled, each of the ranges is from 1 min. to 1 hr. except for HDD power down, which ranges from 1 min. to 15 min. and disable |

PM Control by APM

When enabled, an Advanced Power Management device will be activated to enhance the Maximum Power saving mode and to stop the CPU internal clock. If Advance Power Management (APM) is installed on your system, selecting “Yes” gives better power savings. If the Maximum Power Saving is not enabled, this will be preset to NO.

Video Off Method

This determines the manner in which the monitor is blanked

| | |
|----------------|--|
| V/H SYNC+Blank | This selection will cause the system to turn off the vertical and horizontal synchronization ports and to write blank to the video buffer |
| Blank Screen | This option only writes blank to the video buffer |
| DPMS | Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standard to select video power management values |

MODEM Use IRQ

This determines the IRQ in which the MODEM can be used.

Soft-Off by PWRBTN

When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect

power button activity or Resume by Ring activity.

HDD Power Down

When enabled and after the “Set time of system inactivity”, the hard disk drive will be powered down while all other devices remain active.

Doze Mode

When enabled and after the “Set time system inactivity”, the CPU clock will run at a slower speed while all other devices operate at full speed.

Suspend Mode

When enabled, after the “Set time of system inactivity”, all devices except the CPU will be shut off.

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3-6. PCI Configuration Setup

This section describes the configuration of the PCI bus system. PCI is a system that allows I/O device to operate at speeds nearing the speed of the CPU itself, when communicating with its own special components. This section covers some very technical items. It is strongly recommended that only experienced users make changes to the default settings.

ROM PCI/ISA BIOS (2A5LHU4A)
 PNP/PCI CONFIGURATION
 AWARD SOFTWARE, INC

| | | | |
|--------------------------|---------------|-------------------------|------------|
| PNP OS Installed | : Yes | CPU to PCI Write Buffer | : Enabled |
| Resources Controlled By | : Manual | PCI Dynamic Bursting | : Enabled |
| Reset Configuration Data | : Disabled | PCI Master 0 WS Write | : Enabled |
| | | PCI Delay Transaction | : Enabled |
| IRQ-3 Assigned to | : Legacy ISA | PCI #2 Access #1 Retry | : Enabled |
| IRQ-4 Assigned to | : Legacy ISA | AGP Master 1 WS Write | : Enabled |
| IRQ-5 Assigned to | : PCI/ISA PnP | AGP Master 1 WS Read | : Disabled |
| IRQ-7 Assigned to | : Legacy ISA | | |
| IRQ-9 Assigned to | : PCI/ISA PnP | Assign IRQ For USB | : Disabled |
| IRQ-10 Assigned to | : PCI/ISA PnP | Assign IRQ For VGA | : Disabled |
| IRQ-11 Assigned to | : PCI/ISA PnP | | |
| IRQ-12 Assigned to | : PCI/ISA PnP | | |
| IRQ-14 Assigned to | : PCI/ISA PnP | | |
| IRQ-15 Assigned to | : PCI/ISA PnP | | |
| DMA-0 Assigned to | : PCI/ISA PnP | | |
| DMA-1 Assigned to | : PCI/ISA PnP | | |
| DMA-3 Assigned to | : PCI/ISA PnP | | |
| DMA-5 Assigned to | : PCI/ISA PnP | | |
| DMA-6 Assigned to | : PCI/ISA PnP | | |
| DMA-7 Assigned to | : PCI/ISA PnP | | |

PNP OS Installed

Select “Yes” if the system operating environment is Plug-and-Play software (e.g. Windows95).

Resource Controlled By

The Award Plug and Play BIOS has the capability to configure all the devices automatically with Plug and Play function.

Reset Configuration Data

Normally, you can leave this field Disabled. If you have installed new add-on device and the system configuration has caused a serious conflict that the operating system cannot boot, then, select enabled to reset Extended System Configuration Data (ESCD) when exit setup.

IRQ3/4/5/7/9/10/11/12/14/15 Assigned to

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices are compliant with the original PC/AT bus specification, and are required a specific interrupt (such as IRQ4 for serial port). PCI/ISA PnP Devices are compliant with the Plug and Play standard, no matter if it is originally designed for PCI or ISA bus architecture.

DMA0/1/3/5/6/7 Assigned to

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices are compliant with the original PC AT bus specification, and are required a specific interrupt (such as IRQ4 for serial port). PCI/ISA PnP Devices compliant with the Plug and Play standard, no matter if it is designed for PCI or ISA bus architecture.

CPU to PCI Write Buffer

When enabled, up to four D words of data can be written to the PCI bus without interrupting the CPU. When disabled, a write buffer is not used and the CPU read cycle will not be completed until the PCI bus signals is ready to receive the data.

PCI Delay Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transaction cycles. Select "Enabled" to support compliance with PCI specification version 2.1.

3-7. System Environment

Provides some information such as CPU temperature, speed of cooling fan and usage voltage of CPU for user.

3-8. Integrated Peripherals

ROM PCI/ISA BIOS (2A5LHU4A)
 INTEGRATED PERIPHERALS
 AWARD SOFTWARE, INC

| | | | |
|------------------------|------------|-----------------------|------------|
| OnChip IDE Channel 0 | : Enabled | Onboard Parallel Mode | : ECP |
| OnChip IDE Channel 1 | : Enabled | ECP Mode use DMA | : 3 |
| IDE Prefetch Mode | : Enabled | | |
| HDD Block Mode | : Enabled | Onboard serial Port 3 | :3E8H |
| Primary Master PIO | : Auto | Serial Port 3 Use IRQ | :IRQ5 |
| Primary Slave PIO | : Auto | Onboard serial Port 4 | :2E8H |
| Secondary master PIO | : Auto | Serial Port 4 Use IRQ | :IRQ10 |
| Secondary Slave PIO | : Auto | | |
| Primary Master UDMA | : Auto | Onboard Legacy Audio | : Enabled |
| Primary Slave UDMA | : Auto | Sound Blaster | :Enabled |
| Secondary Master UDMA | : Auto | SB I/O Base Address | : 220H |
| Secondary Slave UDMA | : Auto | SB IRQ Select | : IRQ 9 |
| | | SB DMA Select | : DMA1 |
| Onboard FDD Controller | : Enabled | MPU-401 | : Enabled |
| Onboard Serial Port 1 | : 3F8/IRQ4 | MPU-401 I/O Address | : 330-333H |
| Onboard Serial Port 2 | : 2F8/IRQ3 | Game Port (200-207H) | : Enabled |
| UART 2 Mode | : Standard | | |
| Onboard Parallel Port | : 378/IRQ7 | | |

OnChip First/Second IDE Channel

This chipset contains a PCI/IDE interface with support for two IDE channels. Select “Enabled” to activate the first and/or second IDE interface. Select “Disabled” to deactivate this interface, if a first and/or second add-on IDE interface is installed.

IDE Prefetch Mode

Enable pre-fetch for IDE drive interface that supports its faster drive access. If disk drive errors appear, change the setting to omit the drive interface where the errors occur. Depending on the configuration of IDE subsystem, this field may not appear, and does not appear when the Internal PCI/IDE field is “Disabled”.

IDE HDD Block Mode

This allows hard disk controller to use the fast block mode to transfer data to and from hard disk drive (HDD). Select “Enabled” only if hard drives support block mode.

IDE Primary/Secondary Master/Slave PIO

The four IDE IPO (Programmed Input/Output) fields allow setting a PIO mode (0-4) for each of the four IDE devices, which the onboard IDE interfaces support. Modes 0 through 4 provide successively increased performance. In auto mode, the system automatically determines the best mode for each device.

IDE Primary/Secondary Master/Slaver UDMA

Ultra DMA/33 implementation is possible only if IDE hard drive support its, and the operating environment includes a DMA drive (Windows 95 OSR2 or a third-party IDE bus master driver). If the hard drive and system software both support Ultra DMA/33, select Auto Enable BIOS support.

Onboard FDD Controller

This should be “Enabled” if system has a floppy disk drive (FDD) installed on the system.

Onboard Serial Port 1/ Port 2 / Port 3 / Port 4

This item allows determining the I/O address and IRQ of the onboard serial port.

UART 2 Mode

This item allows determining which Infrared (IR) mode is used onboard.

Onboard Parallel Port

This item allows determining which I/O address of parallel port is onboard.

Onboard Parallel Mode

Select an operating mode for the onboard parallel port. Normal EPP (Extended Parallel Port), ECP (Extended Capabilities Port) ECP+EPP PC/AT parallel port Bi-directional port Fast, buffered port Fast, buffered and Bi-directional port. Select Normal, unless it is sure that the hardware and software both support EPP or ECP mode.

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Chapter 4. VGA, LCD, DOC, IDE Feature

4-1. AGP-BUS VGA Feature

The on-board built-in Graphic Controller is a highly integrated display control device that incorporates a 64-bit 3D/2D graphic engine and video accelerator with advanced DVD video. It provides a flexible and high performance solution for graphics and video playback acceleration for various color depth and resolution modes.

The onboard built-in VGA is a fully integrated CRT and LCD 64-bit 2D/3D Accelerator. The high performance graphics engine offers high-speed 3D image processing in full compliance and compatibility with IBM® VGA and VESA™ extended VGA. As an integrated controller, it allows unprecedented cost and performance advantages by eliminating the need for an external frame buffer while at the same time gaining local access to a larger amount of memory. Many functions can now be eliminated that previously consumed large amounts of bandwidth.

The onboard VGA equipped with a single-cycle 3D GUI Engine, pipelines 3D rendering process architecture in hardware, providing real-time interactions with solid 3D models in CAD/CAM, 3D modeling, and 3D games. It supports all key 3D rendering operations, including: Guard shading for smooth object surfaces, texture mapping for realistic object textures, 16-bit hardware Z-buffering for fast 3D depth calculations, and Alpha Blending for transparency effects.

The onboard VGA controller supports a full AGP implementation internally to remain compatible with existing software and programming models. However, since the engine is integrated it enjoys a higher bandwidth and lower latency than is possible with discrete solutions. AGP operations can include direct access of the system memory by the 2D/3D engine to provide increased texture memory.

To meet the requirements of a PC98 graphics adapter in a multimedia PC, the onboard VGA controller supports planar video format for MPEG-1, MPEG-2, and DVD-video playback. The dual video playback is capable of overlaying windows for videoconferencing and multimedia displays. The onboard VGA controller is capable of supporting three simultaneous displays: CRT (analog monitor), Flat

Panel (digital monitor), each with a different “window” or desktop.

- High Performance single cycle GUI
- Highly Integrated RAMDAC™ and Triple Clock Synthesizer
- Full Feature High Performance 3D Graphics Engine
- High speed internal AGP Bus Mastering data bus supporting DVD video playback & 3D
- Hardware implementation of motion compensation
- Dual Video Windows for Videoconferencing
- TrueVideo® and DirectVideo™ Hardware Support
- Versatile Motion Video Capture/Overlay/Playback Support
- Flexible Frame Buffer Memory Interface
- Advanced Power Management Features
- CRT Power Management (VESA™ DPMS)
- PC98 Hardware Support

4-2. LCD Flat Panel Feature

The on-board flat panel interface is designed to support industry standard TFT and DSTN panels. The Flat Panel interface can also be used to drive external LVDS or PanelLink™.

The high performance VGA Controller provides full hardware level VGA compatibility. At reset, the onboard flat panel is in hardware level VGA mode and all of the standard VGA subsections (Display Controller, VGA Graphics Controller, and Attribute Controller) are enabled.

The onboard flat panel supports LVDS and PanelLink™, provides a low voltage, high speed, low EMI, and serial DC-balanced different data to the LCD panel.

The flat panel interface provides or supports the following functions for various panels:

- Generates flat panel interface signals like **FLM**, **LP**, **SCLK**, and **DE**
- Generates different video data formats to directly drive different types of panels
- Vertical and horizontal expansion of video displays to LCD panel resolution
- Vertical and horizontal centering
- Panel power sequence

4-3. PCI Bus Audio Adapter Features

The Chipset built-in SoundBlaster Pro Hardware and Direct Sound Ready AC97 Digital Audio Controller

- Dual full-duplex direct sound channels and AC97 link
- PCI Master interface with scatter / gather and bursting capability
- 32byte FIFO of each direct sound channel
- Host based sample rate converter and mixer
- Standard v1.0 or v2.0 AC98 Codec interface for single or cascaded AC97 Codec's from multiple vendors
- Loopback capability for re-directing mixed audio streams into USB.
- Hardware SoundBlaster Pro for Windows/DOS box and real-mode DOS legacy compatibility
- Plug and Play with 4 IRQ, 4 DMA and 4 I/O space options for SoundBlaster Pro and MIDI hardware
- Hardware assists FM synthesis for legacy compatibility
- Complete software drivers for Windos-95, Windows-98 and Windows-NT

4-4. DiskOnChip Feature

On board reserved is a 32-pin Socket for DiskOnChip 2000, it is a unique data storage solution to offer a better, faster and more cost effective Flash Disk for applications.

The DiskOnChip 2000 provides a Flash Disk (as BIOS expansion) that does not require any additional bus, slot or connector. Simply insert the DiskOnChip 2000 into a 32-pin socket on your motherboard. With minimal installation costs, you have a bootable Flash Disk. DiskOnChip 2000 has built-in TrueFFS (True Flash File System) technology, which provides full Read/Write disk emulation.

TrueFFS provides hard disk compatibility at both the sector and file level. It works in a variety of operating system environments, such as DOS, Win95, WinCE, WinNT, Psos+ and QNX.

You have to set the correct memory address for DiskOnChip by **JP10**, The driver utilities are placed onto CD-ROM

| JP10 | | Memory Address |
|-------------|----------|-----------------------------------|
| Pin 1-2 | Pin 7-8 | 0C800H - 0C9FFH |
| Pin 1-2 | Pin 9-10 | 0CC00H - 0CDFFH |
| Pin 3-4 | Pin 7-8 | 0DCCCH - 0D1FFH |
| Pin 3-4 | Pin 9-10 | 0D400H - 0D5FFH |
| Pin 5-6 | Pin 7-8 | 0D800H - 0D9FFH(Default) |

4-5. Driver Utility Installation Guide

The directory of driver utilities on the CD-ROM:

For System chipset : "4in1"

Audio Drivers : "686audio"

AGP VGA Drivers : "Mvp4"

PCI IDE / UDMA Drivers : "4in1"



LAN Drivers : "Rtl8139"

DOC Utilities : "Docutl"

When finishing with the Windows platform (95/98/2000/NT) installation, please install the relative VIA driver (**4in1**) utilities for compliance of the compatibility with hardware environment.

We strongly recommend using the 4-in-1 driver to install the system, since the 4-in-1 driver will automatically detect and update the necessary drivers.

This driver will automatically detect and install the latest utilities: **IDE Busmaster**

VIA AGP Driver: Install the VIA AGPVxD driver to enable VIA chipset work with AGP bus function.

IRQ Routing Driver 1.3a: Use the VIA fixing utility to fix all VIA South

bridge with Windows

VIA INF Driver 1.02: Enable VIA chipset to recognize some legacy or PCI devices

LAN Driver: Install the LAN driver for on-board LAN adapter. Please refer to Chapter 5-9, the Realtek 8139 LAN Driver Installation Procedure.

VGA Driver: Install the VGA driver for on-board AGP VGA adapter

Please download or check from VIA Web-site: www.via.com.tw if you prefer to install the drivers individually or you need more information.

Chapter 5. LAN Adapter

The on-board LAN adapter use the Single Chip Fast Ethernet Controller, that is highly integrated and requires no “glue” logic external memory on board. It runs in the bus master mode and directly send/receive Ethernet packet to/from memory. The On-board LAN adapter can directly fetch the system CPU. Also, it can transfer data Directly between I/O devices and system memory in the 32-bit bus master mode that provides low CPU utilization.

It complies with the IEEE 802.3u standard, IEEE802.3 standard and PCI Local Bus version 2.1 and transmits data on the network at 100 Mbps or 10 Mbps. It also operates in full-duplex mode that **doubles the network speed up to 20/200 Mbps when working with Fast Switching Hub**. Built-in one RJ-45 port for connection of 100Base-TX Fast Ethernet or 10Base-T Ethernet network, and automatically senses the connection type.

5-1. Features

- Full compliancy with PCI Rev. 2.1
- Complies with the Ethernet/IEEE 802.3u 100Base-TX and 10 Base-T industry standard
- Supports full-duplex operations, thus doubling the network speed up to 20Mbps on 10 Base-T Ethernet or 200Mbps on 100 Base-TX Fast Ethernet when setting in full duplex mode
- Two LED indicators to report network status
- One RJ-45 connector with Auto-sense cable type of 10 or 100Mbps network operation
- Supports PCI clock speed up to 33MHz, capable of zero wait states
- Supports optional Remote Boot ROM socket
- Provides a comprehensive setup program for displaying the adapter configuration and includes diagnostic on board or network tests.

- Complete drivers for Novell, ODI, SCO UNIX, LAN Manager, Windows NT and Windows 95/98 Packet driver etc

5-2. UTP Cable / RJ-45 Jack Definition

Straight through twisted pair cable is typically used to connect a hub to a server or workstation. In a straight through connection, Pin 1 at the server, Pin 2 at the hub connects to Pin 2 at the server, and so on. Figure A-1 shows the locations of pins on a standard RJ-45 plug on a twisted-pair cable.

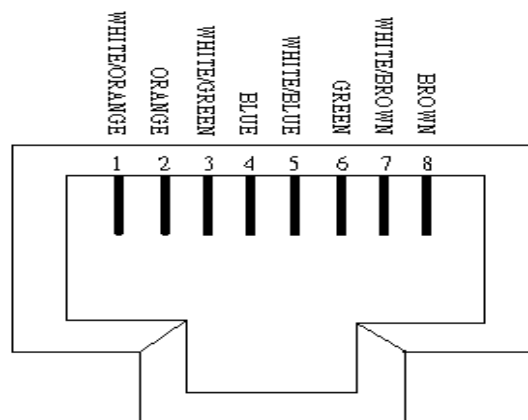
Table A-1 shows the wiring in a straight-through twisted-pair cable (Pins 4,5,7 and 8 are not used).

| Twisted Pair Number | Pin Number | Signal Description | To | Pin Number | Signal Description |
|---------------------|------------|--------------------|----|------------|--------------------|
| 1 | 1 | TD+ | → | 1 | TD+ |
| | 2 | TD- | | 2 | TD- |
| 2 | 3 | RD+ | → | 3 | RD+ |
| | 6 | RD- | | 6 | RD- |

RJ-45 Connector Pin Assignments

Figure A-1 shows the RJ-45 Connector pin assignments

RJ45 PIN AND CABLE COLORS



5-3. Connecting 100Base-TX Fast Ethernet Network

The system board provides an RJ-45 port for connection to 100Base-TX Fast Ethernet or 10Base-T Ethernet Network with a single connection over unshielded twisted-pair (UTP). The adapter automatically operates at 10Mbps or 100Mbps when the appropriate 10/100Base hub be connected.

To connect the adapter to 100Base-TX Fast Ethernet Network, you need a twisted-pair Category 5 cable with RJ-45 modular jacks at both ends. This cable can have a maximum length of 300 feet (100 meters).

5-4. Connecting 10Base-T Ethernet Network

To connect the adapter to a 10Base-T Ethernet Network, you need a twisted-pair Category 3, 4 or 5 cables with RJ-45 modular jacks at both ends. This cable can have a maximum length of 300 feet (100 meters).

5-5. 10Mbase-T/100Mbase-T Installation Notice

- 100Mbps network must be shielded twisted-pair (STP) or Category 5 unshielded twisted-pair cable. Do not use a Category 3 or 4 cable for 100Mbps-network operation, it could cause data loss. Category 3 or 4 cable is good for 10Mbps network only.
- Category 5 cable is also good for 10Mbps operation. Use UTP Category 5 cable for the versatility to operate the network at either 100Mbps or 10Mbps speed without changing cable.
- Two pairs of wiring are required.
- Depending on building codes, different insulation materials may be required. Plenum-rated or TEFLON-coated wiring maybe required in some areas where fireproofing is required.
- The wire gauge should be between 18 and 26 AWG (Most telephone installations use 24-gauge wiring).

- UTP cable should meet the following requirements:
 1. Solid copper
 2. Nominal capacitance: less than 16pF/ft
 3. Nominal impedance: 100 ohms
 4. Nominal attenuation: less than 11.5db

Automatic Selection of the Media Type

While the driver installs, it automatically detects the media type based on the type of cable connected. Once you change the cable type, you must reinstall the driver to execute auto-detect again.

If the driver cannot detect which cable is connected or whether a cable is connected, look at cabling network driver (Ex. Modify net.cfg file parameters—force line speed=10 or 100).

10/100 Auto – Negotiation (N-Way)

Depending on the hub or connected device, the LAN adapter can automatically run at the appropriate speed, by using N-way, a feature that complies with the IEEE802.3 standard. It also works with any of the other IEEE-compliant products.

5-6. Remote BOOT ROM Installation Guide

A BOOT ROM allows the computer to boot up over the network, instead of using the local operating system device. This enables the system to be a diskless workstation environment.

1. Make sure the BOOT ROM is properly oriented. Incorrect orientation may damage the chip!
2. Use the utility of RSET8139.exe to enable the BOOT ROM.
3. Reboot the system to use the BOOT ROM function.

BOOT ROM Type:

Once the PCI system detects the presence of a BOOT ROM chip on the adapter during boot-up, it will automatically set a working configuration. Supports 64K FLASH EPROM's for an upgrade BOOT ROM.

5-7. LED Indicators

The system board comes with two LED indicators on the edge of the motherboard that indicates the network system status. If you experience any problems with the adapter, first make sure the appropriate driver is loaded, the proper cable is connected to the RJ-45 port and the hub complies with the adapter specification, such as 10Mbps 10Base-T or 100Mbps 100Base-TX. Finally, recheck the LEDs.

FUDUP (Full Duplex) Indicator

When indicator is ON, it indicates Full-duplex mode: otherwise, it is OFF. The adapter supports full duplex at 10 or 100Mbps. If the switch-hub supports the N-way feature and full duplex, the system automatically runs in full duplex mode.

Tx/Rx (Transmit/Receiver) Indicator

This indicator flashes to display that there is network activity – indicating transmission or reception data from the network.

5-8. The Setup Program

The package includes a diskette containing the setup program. This program allows you to verify the configuration and isolation of faults.

The adapter's I/O port address and interrupt request levels (IRQ) are set by the BIOS. Other default settings can be changed for situations as shown below.

Problem (RESET8139.exe) provides the following function:

- Displays the current configuration of the adapter
- Performs network diagnostic tests to verify the operation of the adapters basic functions, and the adapters ability to communicate over the network with another adapter.
- Provides set up for new configuration to make a change specify settings: Remote BOOT ROM, Flow Control and Full-Duplex mode Enable/or Disable

Full duplex operation is set automatically if the Full-duplex option is set to Disable. Please follow the prompt instructions to set-up or change the system configuration.

Note: Before running the setup program, make sure the adapter driver is not loaded; otherwise the unpredictable results may arise!

The setup program can be set the on board configuration to provide diagnostic testing. It is for testing the basic function verification, EEPROM data Access, loopback operation, and the ability to communicate over the network with another adapter.

To access this program, insert the Driver Diskette into the floppy disk drive and then type the following at the DOS prompt:

➤ A:\REST8139.EXE <ENTER>

1. View Current Configuration

This allows you to find the PCI Fast Ethernet adapter current configuration in your system.

2. Set Up New Configuration

Select New Set Up Configuration option from the main menu

The option settings can be changed, the table shown as below:

| Option | Default Setting | Other Available Settings |
|--------------|---------------------------|--|
| Full-duplex | Disabled → Auto Selection | Enable – Forces to full duplex operation |
| Flow Control | TX Enable, RX Enable | TX Disable, RX Disable |

Note: Before setting the adapter for full duplex, make sure the hub switch is also set to full duplex. Before you activate the switching hub to server connection, make sure the hub switch and adapter are configured for full duplex.

3. Run Diagnostics

Running diagnostic tests perform a basic function verification for on board LAN adapters. The basic Diagnostic tests includes:

- **EEPROM Test:** EEPROM data read/write test

- **Diagnostics On Board:** Performs on board basic function verification
- **Diagnostics On Network:** To run this test on the network, you will need another computer set up as a Responder to receive packets from the adapter being tested and echo them back to the adapter. This checks the adapter's ability for communication over the network with another adapter to receive and transmit network packets.

4. Software Installation

Installing Network Drivers

You must install a network driver to allow the adapter to work with your network operating system.

The system board provides various network drivers on the driver diskette. The following provides the installation procedures for different network drivers.

| |
|--|
| <p>Note: Please install the "VIA PATCH FILE" first if you want to link your LAN with Windows 98</p> |
|--|

For detailed information of each OS installation, please refer to the README(.TXT) file on the driver diskette.

Software Installation Examples

Before you starting to install the driver programs, please refer to each directory that contains a README file, which provides you with detailed installation instructions, or to execute the HELP8139.EXE help file viewer in DOS. The utility will then present you with a screen showing the information about how to install the network driver. Driver needed for the adapter to work with your operating system.

5-9. The Realtek 8139 LAN Driver Installation Procedure:

Please note: The LAN Driver installation has to be done after completing Win 95/98/2000 installation.

When completed with the WIN 95/98 installation, please click “My Computer” to start your LAN driver installation (procedure listed as below):

***My Computer → Control Panel → System → Device Manager →
? Other Devices → ?***

***PCI Ethernet Controller → Properties → Driver → Update Drive
→ Yes (Recommended) → Next → Other Locations → Browse
→ A:\Rtsnt.100\Exe\Win95 → OK → Finish***

After finishing the above procedure, the screen will show “copy the files from?”

Please type A:\Rtsnt.100\Exe\Win95=> OK and select “OK”, the system will ask you to insert Win95 driver diskette to update new driver.

After finishing the above steps, please shut down your system and re-boot the system.

Appendix A: FLASH Memory Utility

Use this utility to update the system BIOS from a disk file to the on board Flash memory. Be aware the improper change of the system BIOS will cause the system to malfunction.

Use utility as follows:

1. Insert the FLASH memory utility distribution floppy diskette in drive A:
2. At the DOS prompt, type A:>AWDFLASH and press <Enter>

| |
|--|
| FLASH MEMORY WRITE v7.21 Copyright 1993, Award Software, Inc |
| For VIA MVP3-W877TF-2A5LEU4BC-0 Flash Type – SST 29EE020 / 5V |
| File Name to Program: |
| Error Message: Do you want to save BIOS settings (Y/N) |

3. Enter the name of the system BIOS disk file into the "File Name to Program" field

The following message appears in the "Error Message" field

4. Do you want to save BIOS (y/n)?
5. To update the FLASH memory from the system BIOS disk file, type Y
6. After complete updating, please re-boot the system
7. For upgrade BIOS procedure, please refer to our web site:
<http://www.unicorn-computer.com.tw>

Appendix B: Connector Pin Assignment

PS/2 Keyboard / Mouse Pin Header Connector (CN7)

| Pin No. | PS/2 Keyboard Description | Pin No. | PS/2 Mouse Description |
|----------------|----------------------------------|----------------|-------------------------------|
| 1 | K/B_Data | 2 | Mouse_Data |
| 3 | N.C | 4 | N.C |
| 5 | Grounded | 6 | Grounded |
| 7 | +5V DC | 8 | Mouse_VCC |
| 9 | K/B_Clock | 10 | Mouse_Clock |

COM1, COM2, COM3, COM4 for standard RS232 defined

| Pin No. | Description | Pin No. | Description |
|----------------|--------------------|----------------|--------------------|
| 1 | DCD | 6 | DSR |
| 2 | RXD | 7 | RTS |
| 3 | TXD | 8 | CTS |
| 4 | DTR | 9 | RI |
| 5 | GND | | |

COM1, for RS422 Mode defined

| Pin No. | Description | Pin No. | Description |
|----------------|--------------------|----------------|--------------------|
| 1 | -TXD | 6 | DSR |
| 2 | +RXD | 7 | RTS |
| 3 | +TXD | 8 | CTS |
| 4 | DTR | 9 | -RXD |
| 5 | GND | | |

Printer (LPT) Port

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | STB# | 10 | ACK# |
| 2 | PD0 | 11 | BUSY |
| 3 | PD1 | 12 | PE |
| 4 | PD2 | 13 | SLCT |
| 5 | PD3 | 14 | AFD# |
| 6 | PD4 | 15 | ERR# |
| 7 | PD5 | 16 | INIT# |
| 8 | PD6 | 17 | SLIN# |
| 9 | PD7 | 18-25 | GND |

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VGA Connector

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | RED | 9 | GND |
| 2 | GREEN | 10 | GND |
| 3 | BLUE | 11 | N.C |
| 4 | N.C | 12 | DDC DAT |
| 5 | GND | 13 | H.Sync |
| 6 | GND | 14 | V.Sync |
| 7 | GND | 15 | DDC CLK |
| 8 | GND | | |

TTL Out1 via COM2

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 10 | VCC | 5 | TXD2 |
| 9 | GND | 4 | -RTS2 |
| 8 | -R12 | 3 | RXD2 |
| 7 | -DTR2 | 2 | -DSR2 |
| 6 | -CTS2 | 1 | -DCD2 |

External Speaker Connector (J1)

| Pin No. | Description |
|---------|-------------|
| 5 | SPK |
| 6 | N.C |
| 7 | GND |
| 8 | Vcc |

LCD Panel 18Bit /16Bit TFT/DSTN Mapping

| 18Bit TFT | 16Bit DSTN | 18Bit / 18+18 TFT | Pin No. |
|-----------|------------|-------------------|---------|
| NC | N.C. | FPD23 | 9 |
| NC | N.C | FPD22 | 10 |
| NC | N.C | FPD21 | 17 |
| NC | N.C. | FPD20 | 18 |
| NC | N.C | FPD19 | 25 |
| NC | N.C | FPD18 | 26 |
| B0 | N.C | FPD17 | 11 |
| B1 | N.C | FPD16 | 12 |
| G0 | UD7 | FPD15 | 19 |
| G1 | UD6 | FPD14 | 20 |
| R0 | UD5 | FPD13 | 27 |
| R1 | UD4 | FPD12 | 28 |
| B2 | UD3 | FPD11 | 13 |
| B3 | UD2 | FPD10 | 14 |
| B4 | UD1 | FPD9 | 15 |
| B5 | UD0 | FPD8 | 16 |
| G2 | LD7 | FPD7 | 21 |
| G3 | LD6 | FPD6 | 22 |
| G4 | LD5 | FPD5 | 23 |
| G5 | LD4 | FPD4 | 24 |
| R2 | LD3 | FPD3 | 29 |
| R3 | LD2 | FPD2 | 30 |
| R4 | LD1 | FPD1 | 31 |
| R5 | LD0 | FPD0 | 32 |

LCD Connector1: (LCD_CON1)

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| 1 | VBL (+12) | 2 | VBL (+12) |
| 3 | GND | 4 | GND |
| 5 | VDD(+3.3V) | 6 | VDD(+3.3V) |
| 7 | DISP.OFF | 8 | GND |
| 9 | FPD23 | 10 | FPD22 |
| 11 | FPD17 | 12 | FPD16 |
| 13 | FPD11 | 14 | FPD10 |
| 15 | FPD9 | 16 | FPD8 |
| 17 | FPD21. | 18 | FPD20 |
| 19 | FPD15 | 20 | FPD14 |
| 21 | FPD7 | 22 | FPD6 |
| 23 | FPD5 | 24 | FPD4 |
| 25 | FPD19 | 26 | FPD18 |
| 27 | FPD13 | 28 | FPD12 |
| 29 | FPD3 | 30 | FPD2 |
| 31 | FPD1 | 32 | FPD0 |
| 33 | GND | 34 | GND |
| 35 | SHIFT CLOCK | 36 | (V-SYNC)FLM |
| 37 | DATA ENABLE | 38 | (H-SYNC)LP |
| 39 | GND | 40 | NC |
| 41 | NC | 42 | KEY. |
| 43 | VDD (+5V) | 44 | VDD (+5V) |

Audio Output Port Connector (CN3)

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|----------------------|
| 1 | A_BIT_CLK | 2 | TV_COMP (TV-OUT) |
| 3 | A_SD_IN | 4 | TV_LUMA (TV-OUT) |
| 5 | A_SD_IN2 | 6 | TV_CRMA (TV-OUT) |
| 7 | A_SD_OUT | 8 | GND |
| 9 | A_RESET | 10 | GND |
| 11 | A_SYNC | 12 | GND |
| 13 | SPEAKER | 14 | AUDIO ENABLE/DISABLE |
| 15 | VCC3 | 16 | +12V |
| 17 | JBCY | 18 | JAB2 |
| 19 | JBCX | 20 | JAB1 |
| 21 | JACY | 22 | JBB2 |
| 23 | JACX | 24 | JBB1 |
| 25 | JMS0 | 26 | JMSI |

HDD LED (J1)

| Pin No. | Description |
|---------|-------------|
| 1, 3 | LED - |
| 2, 4 | LED + |

Keylock / Power – LED (J1)

| Pin No. | Description |
|---------|-------------|
| 11 | Keylock |
| 12 | GND |
| 13 | Power LED |
| 14 | Power LED |

USB PORT 1/2 : (CN8)

| Pin No. | | Description |
|---------|----|----------------|
| 1 | 2 | USB VCC |
| 3 | 4 | USB DATA-(0,1) |
| 5 | 6 | USB DATA+(0,1) |
| 7 | 8 | USB_GND |
| 9 | 10 | USB_GND |

IR Connector (IR1)

| | | | |
|-------|-----|-------|------|
| Pin 1 | GND | Pin 4 | IRRX |
| Pin 2 | VCC | Pin 5 | IRTX |
| Pin 3 | GND | Pin 6 | VCC |

PCI Expansion Slot Pin assignment.

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| A1 | TRST# | B1 | -12V |
| A2 | +12V | B2 | TCK |
| A3 | TMS | B3 | GND |
| A4 | TDI | B4 | N.C. |
| A5 | +5V | B5 | +5V |
| A6 | -INTR_B | B6 | +5V |
| A7 | -INTR_D | B7 | -INTR_C |
| A8 | +5V | B8 | -INTR_A |
| A9 | N.C. | B9 | N.C. |
| A10 | +5V | B10 | N.C. |
| A11 | N.C. | B11 | N.C. |
| A12 | GND | B12 | GND |
| A13 | GND | B13 | GND |
| A14 | N.C. | B14 | N.C. |
| A15 | -PCIRST | B15 | GND |
| A16 | +5V | B16 | PCICLK |
| A17 | -PCIGNT1 | B17 | GND |
| A18 | GND | B18 | -PCIREQ1 |
| A19 | -PME | B19 | +5V |

| | | | |
|-----|--------|-----|---------|
| A20 | AD30 | B20 | AD31 |
| A21 | N.C. | B21 | AD29 |
| A22 | AD28 | B22 | GND |
| A23 | AD26 | B23 | AD27 |
| A24 | GND | B24 | AD25 |
| A25 | AD24 | B25 | N.C. |
| A26 | AD23 | B26 | -C_BE3 |
| A27 | N.C. | B27 | AD23 |
| A28 | AD22 | B28 | GND |
| A29 | AD20 | B29 | AD21 |
| A30 | GND | B30 | AD19 |
| A31 | AD18 | B31 | N.C. |
| A32 | AD16 | B32 | AD17 |
| A33 | N.C. | B33 | -C_BE2 |
| A34 | -FRAME | B34 | GND |
| A35 | GND | B35 | -IRDY |
| A36 | -TRDY | B36 | N.C. |
| A37 | GND | B37 | -DEVSEL |
| A38 | -STOP | B38 | GND |
| A39 | N.C. | B39 | -PLOCK |
| A40 | SDONE | B40 | -PERR |
| A41 | -SBO | B41 | N.C. |
| A42 | GND | B42 | -SERR |
| A43 | PAR | B43 | N.C. |
| A44 | AD15 | B44 | -C_BE1 |
| A45 | N.C. | B45 | AD14 |
| A46 | AD13 | B46 | GND |
| A47 | AD11 | B47 | AD12 |
| A48 | GND | B48 | AD10 |
| A49 | AD9 | B49 | GND |
| A50 | KEY | B50 | KEY |
| A51 | KEY | B51 | KEY |
| A52 | -C_BE0 | B52 | AD8 |
| A53 | N.C. | B53 | AD7 |
| A54 | AD6 | B54 | N.C. |
| A55 | AD4 | B55 | AD5 |
| A56 | GND | B56 | AD3 |

| | | | |
|-----|--------|-----|--------|
| A57 | AD2 | B57 | GND |
| A58 | AD0 | B58 | AD1 |
| A59 | +5V | B59 | +5V |
| A60 | -REQ64 | B60 | -ACK64 |
| A61 | +5V | B61 | +5V |
| A62 | +5V | B62 | +5V |

PC-104 Expansion slot pin assignment

| Pin No. | Description | Pin No. | Description |
|---------|-------------|---------|-------------|
| A1 | -IOCHK | B33 | GND |
| A2 | SD7 | B34 | RST_DRV |
| A3 | SD6 | B35 | +5V |
| A4 | SD5 | B36 | IRQ9 |
| A5 | SD4 | B37 | -5V |
| A6 | SD3 | B38 | DREQ2 |
| A7 | SD2 | B39 | -12V |
| A8 | SD1 | B40 | -0WS |
| A9 | SD0 | B41 | +12V |
| A10 | IORDY | B42 | N.C. |
| A11 | BAEN | B43 | -SMEMW |
| A12 | SA19 | B44 | -SMEMR |
| A13 | SA18 | B45 | -IOW |
| A14 | SA17 | B46 | -IOR |
| A15 | SA16 | B47 | -DACK3 |
| A16 | SA15 | B48 | DREQ3 |
| A17 | SA14 | B49 | -DACK1 |
| A18 | SA13 | B50 | DREQ1 |
| A19 | SA12 | B51 | -REFRESH |
| A20 | SA11 | B52 | SYSCLK |
| A21 | SA10 | B53 | IRQ7 |
| A22 | SA9 | B54 | IRQ6 |
| A23 | SA8 | B55 | IRQ5 |
| A24 | SA7 | B56 | IRQ4 |
| A25 | SA6 | B57 | IRQ3 |
| A26 | SA5 | B58 | -DACK2 |

| | | | |
|-----|-------|-----|-------------|
| A27 | SA4 | B59 | TC |
| A28 | SA3 | B60 | BALE |
| A29 | SA2 | B61 | +5V |
| A30 | SA1 | B62 | 14.31818MHz |
| A31 | SA0 | B63 | GND |
| A32 | GND | B64 | GND |
| | | | |
| C1 | GND | D21 | GND |
| C2 | -SBHE | D22 | -MEMCS-16 |
| C3 | SA23 | D23 | -IOCS16 |
| C4 | SA22 | D24 | IRQ10 |
| C5 | SA21 | D25 | IRQ11 |
| C6 | SA20 | D26 | IRQ12 |
| C7 | SA19 | D27 | IRQ15 |
| C8 | SA18 | D28 | IRQ14 |
| C9 | SA17 | D29 | -DACK0 |
| C10 | -MEMR | D30 | DREQ0 |
| C11 | -MEMW | D31 | -DACK5 |
| C12 | SD8 | D32 | DREQ5 |
| C13 | SD9 | D33 | -DACK6 |
| C14 | SD10 | D34 | DREQ6 |
| C15 | SD11 | D35 | -DACK7 |
| C16 | SD12 | D36 | DREQ7 |
| C17 | SD13 | D37 | +5V |
| C18 | SD14 | D38 | -MASTER |
| C19 | SD15 | D39 | GND |
| C20 | N.C. | D40 | GND |

Appendix C: LIMITED WARRANTY

Standard one year limited warranty on all our ENDAT series all-in-one motherboards and embedded board. Products that become defective during the warranty period shall be repaired, or subject to manufacturer's option, replaced. The limited warranty applies to normal proper usage of the hardware and does not cover products that have been modified or subjected to unusual electrical or physical stress. Unicorn Computer Corp. is not responsible to repair or replace defective goods caused by improper using or use of unauthorized parts. The following situations will be charged:

1. The products during the warranty but defective caused by improper using or artificial external pressure and result in the components damages. According to the damage situation, the manufacturer has the rights to decide to repair or not. The manufacturer will charge the parts/repair cost and the returning shipping charge.
2. The products out of warranty will charge the parts/repair cost and the returning shipping charge as per repair status.
3. The manufacturer has the rights to decide to repair or not based on the stock of parts for the products which are phased out of the production.
4. Please e-mail or fax the RMA Service Request Form for RMA number when there are defective products.

● **Issue Code of defect.**

| | | | |
|----|--------------------------|----|--------------------|
| 01 | Second Times R.M.A. | 11 | Memory Socket Bad |
| 02 | No Screen (No Boot) | 12 | Hang Up Hardware |
| 03 | VGA (Display) Fail | 13 | Hang Up Software |
| 04 | CMOS Data Lost | 14 | PCB Problem |
| 05 | FDC Fail | 15 | CPU Socket Bad |
| 06 | HDC Fail | 16 | LAN Fail |
| 07 | Bad Slot | 17 | Audio Fail |
| 08 | BIOS Problem | 18 | Serial Port Fail |
| 09 | Keyboard Controller Fail | 19 | Parallel Port Fail |
| 10 | Cache RAM Problem | 20 | Others |

Please specify the following when returning the RMA boards:

(1) Hardware Configuration (2) OS or Software (3) Testing Program

Authorized Signature